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10. November 2008

Online at <http://mpra.ub.uni-muenchen.de/12636/>

MPRA Paper No. 12636, posted 14. January 2009 09:12 UTC

EMPIRICAL ASSESSMENT OF NIGERIA'S AGRICULTURAL EXPORT AND ECONOMIC WELFARE

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ABSTRACT

This paper assessed empirically Nigeria's agricultural export and economic welfare. Data used for the study were obtained from secondary sources, bulk of which was collected from institutional and national databases over 1990-2005 and were analyzed using multiple regression and growth rate analysis. The results showed that agricultural output, inflation, subsidy, exchange rate, food import and export were statistically significant at various risk levels and have major implications on the economic welfare of Nigeria. Economic welfare was found to have grown at rate of 2.9% over the period and would be expected to reach N20, 480.64 million in 2010. The study suggested that Nigerian government should adopt appropriate monetary policies to ensure stability in the foreign exchange market in view of the bizarre implications of fluctuations on economic welfare.

Keywords: economic, agricultural exports, welfare, empirical, assessment

INTRODUCTION

Agriculture, the second largest sector after oil, fell from 48 per cent of GDP in 1970 to 20.6 per cent in 1980 and was only 23.3 per cent of GDP in 2005. Agricultural exports are negligible and represent about 0.2 per cent of total exports. Nevertheless, an estimated 60 per cent of Nigerians are employed in the rural sector [8]. Agriculture contributes to employment, food production, foreign exchange earnings and industrial inputs. In 2001, agriculture was about 41 per cent of GDP. Some 60 per cent of the workforce is employed in agriculture, predominantly smallholders [4]. Nigeria has a total land area of 98.3 million hectares, of which only 71.2 million hectares are cultivable. Only 34.2 million hectares (about 48 per cent of the cultivable area) are actually being cultivated, and less than 1 per cent of the arable land is irrigated [9].

The export of agricultural commodities was much more widely spread amongst the tropical African countries. Generally, the rise of agricultural export has been a considerable success story and one that has brought numerous benefits to Africa. Even though the agriculture is still the leading earner of foreign exchange from non-petroleum exports, Nigeria is one of the leading nations in importation of food to supplement local production [10].

In spite of the remarkable performance of agriculture, some problems persisted, including inadequate supply of fertilizers and other farming inputs, and the time lag between the supply and distribution of inputs and the planting period. The prices of Nigeria's major agricultural commodities continued to

decline in the world market. The fall in prices was attributed largely to weak international demand and excess supply.

Revenues from major export commodities fell by almost 50%, despite rise in volume terms and this has led not only to hunger, poverty and malnutrition but to considerable threat on economic welfare in African countries [11].

The exportation of some agricultural produce from Nigeria to neighboring countries such as Chad and Niger in the form of food aid to cushion the effects of drought in these countries, however affected the prices of other commodities, such as tea and cotton which fell by 37.5 and 2.5 percent respectively [5]. Agriculture has been in crisis throughout the Sub-Saharan Africa. The real price of the major agricultural commodities traded in the world market has shown a steady decline over the years. The decline in export earning must have been engendered by short-fall in production which has forced most developing economies to depend on importation of food. As a result of the international specialization, the economic performance of the region over the years has been deplorable and disappointing, and this can be attributed to the growth in expenditure on food import and failing export earnings which has brought with it a deep economic mess and a growing balance of payment deficit coupled with using external debts [11]. Despite the involvement of African countries in international trade, hunger, malnutrition, unemployment and poverty continues to stake a turn for the worse thereby leading to threat on economic welfare in Nigeria. The duo crisis of food and finance around the world had left agricultural export and economic welfare on its lowest ebb in Nigeria. It is in view of the foregoing that this study was articulated.

Specifically, this study intended to evaluate the impact of relevant economic variables on welfare of Nigerians; to ascertain the effect of time on welfare and predict welfare situation over the next five years.

MATERIALS AND METHODS

The Study Area

The study area was Nigeria. Nigeria is located between latitude $4^{\circ} 20'$ and 14° North and between longitudes $3^{\circ} 20'$ and $14^{\circ} 30'$ East, covering a geographical space of 923,768 square kilometers. Its coastline stretches across a space of over 790 kilometres while the coastal to the northern limit is a distance of about 1,040 kilometres. A multi-ethnic society, Nigeria is the most populous nation in Africa, having a population of 140,003,542 people and population density of 152 per square kilometer [14, 6]. Among the country's water resources are river Niger and Benue and are 1174.6km and 796.5km long respectively that transverse with a confluence at Lokoja, Kogi state. The country is bounded by Niger and Chad due North, Niger and Benin due West, Cameroon due East and the Gulf of Guinea due South.

Nigeria is supposedly a rich country with a GDP of about \$40 (41% of West Africa's GDP) and substantial human and natural resource endowment. As the sixth oil producing country in the world, Nigeria exports over 80 per cent of its crude petroleum and nearly 95% of the country's foreign exchange earnings come from it while the consumption pattern has high import contents. [7].

Agriculture is the largest single sector of the economy, providing employment for a significant segment of the work force and constituting the mainstay of Nigeria's large rural community which accounts for nearly two-thirds of the population. The proportion of the GDP attributable to agriculture hovers between 30-40%. The favourable climatic conditions and vegetation makes Nigeria able to provide crops and livestock [11].

Method of Data Collection

The data used in this study were obtained from secondary sources. The bulk of the data were collected from available information over the 1990-2005 period from various publications, trade figures from the financial and economic review, statistical bulletin of the Federal Office of Statistics (FOS) various issues, annual reports and statement of accounts and monthly report by the central bank of Nigeria [6].

Method of Data Analysis

In order to realize the broad objective of the study, multiple regression and growth rate analysis were employed as analytical tools. The four functional forms of the multiple regression were tried and the

best result was chosen on the basis of its conformity with econometric and statistical criteria such as R^2 , F-ratio, Durbin Watson (DW) estimates and number and degree of significance of the variables. From the foregoing, the multiple regression is specified as :

$$Y = f(X_1 + X_2 + X_3 + X_4 + X_5 + X_6 + X_7 + X_8 + \epsilon)$$

Where;

Y = Gross Domestic Product (#million)

X_1 = Output of agricultural commodities (tons)

X_2 = Inflation rate (%)

X_3 = Interest rate (%)

X_4 = Subsidy (#million)

X_5 = Exchange rate (%)

X_6 = Food import (#million)

X_7 = Food export (#million)

X_8 = Real per capita income (#)

ϵ = Composite error term

The growth analysis was used to show increase or decline in the level of economic welfare in Nigeria.

The analysis covered a period of sixteen (16) years i.e. 1990-2005. Descriptive statistics were used to estimate the changes in the GDP for the next five (5) years. The growth rate is denoted as “r” and can be calculated thus;

$$r = \beta \times \frac{100}{1}$$

where;

β = coefficient of time variable on the GDP.

Conceptual Framework

GDP – A Measure of Economic Welfare

The GDP derives its strength from the use of a monetary unit as a measuring tool, and from the underlying assumption that what is countable i.e. that wealth is monetary by nature [3].

Two of the most widely used welfare measures are Gross Domestic Product (GDP) and GDP per capita. Although they were not originally designed to measure welfare, these indicators have become normative benchmark for economic and even social performance [2].

However, the use of GDP as a welfare measure has been criticized since the early development of its underlying framework of the national accounts. [2], one of the founding fathers of the national accounts expressed his concerns on this topic and highlighted four ambiguous terms in the definition of national income. These ambiguous make that, contrary to popular belief, GDP is not a value-free tool.

Criticism was also initiated by the social and the environmental movements' claims for the inclusion of natural capital in the national accounts and for adopting social indicators such as life expectancy and literacy rate as complements to the economic indicators have grown through the years. A final category of criticism is of a more technical and methodological nature [15].

Accepting the shortcomings of GDP and stating that this measure was never intended to be used as a welfare indicator is not the right way out, since this will not stop GDP from being used in this way. Alternative measures exist already such as Genuine Progress Indicator (GPI) and Index of Sustainable Economic Welfare (ISEW) but as long as they lack wide acceptance as comprehensive indicators of welfare, GDP will be filling the role of welfare measure by default [2]. Despite their limited acceptance, the availability of relevant data for computation of the alternative indicator is an issue to be worried about especially in the developing countries.

RESULTS

Impact of Selected Factors on Economic Welfare

In estimating the impact of selected economic factors on welfare, the four-functional forms of multiple regression were tried (table 1). The results showed that agricultural output, inflation, subsidy, exchange rate, food import and export were statistically significant at various risk levels. From table 2 which applied the growth rate formula, we have

$$0.029 \times \frac{100}{1} = 2.9\%$$

The growth rate analysis revealed that the economic welfare of Nigerians was growing positively within the period at the rate 2.9%.

DISCUSSION

Following the OLS analysis as shown by table 1, the lead equation was selected on the basis of statistical and econometric criteria such as value of, R^2 , F-ratio, number and degree of significance of the independent variables and absence of autocorrelation error in the model using Durbin-Watson estimate as a gauge. R^2 is the coefficient of multiple determination; DW stands for Durbin-Watson.

Time series usually shows signs of autocorrelation and non-stationary and that is why Ordinary Least Square Method (OLS) cannot be applied to it without some transformation achieved sometimes by logging and/or by differencing.

The double-log was selected as the lead equation from the four-functional forms because it met all the criteria (statistical and econometric) for selection. It has the least standard error of the parameter estimates; Durbin-Watson (DW) value that fell within desirable range; high coefficients of multiple determination (R^2) and desirable signs. Other three functional forms- exponential, linear, and semi-log showed the presence of auto-correlation error as confirmed by their DW estimates. DW estimates ranges from 0 – 4 but values closer to 0 and 4 indicate the presence of auto-correlation error. Estimates within the 1.5 - 2.5 range show absence of auto-correlation error.

The R^2 value of 0.955 showed that the data set fits the regression line up to 95.5% and confirms the quality and extent of its goodness of fit. From the result, it could be observed that the coefficients of output, inflation, exchange rate, food import and food export were significant at 95% confidence level while subsidy was significant at 1% risk level.

Having possessed a positive coefficient, increase in output by 5.42% engendered 10% increase in the GDP and as such, impact positively on the welfare of the citizenry. Inflation, in line with *a priori*, possessed a negative elasticity and implied that with rising inflationary rates, the welfare of the country

worsens. As expected, subsidy possessed a positive coefficient and showed that welfare increased by 10% with 2.11% increase in subsidy. With a negative elasticity, exchange rate confers an inverse relationship with economic welfare. This means that increase in exchange rate influences the welfare negatively and increased exchange rate, in this context, is perceived a leakage in the economy. This result agrees with the findings of [1] that had a similar outcome. Both food export and import were significant at 5% risk level. The positive sign possessed by food import contradicts *a priori* expectation. This reflected heavy dependence on import which is common in developing economies due to paucity of local output engendered by low productive capacity.

The growth rate analysis as depicted by table 2 revealed that the impact of time factor on the GDP was positive. As such, the economic welfare as proxied by the GDP increased by the rate of 2.9% annually. By this, the GDP of Nigeria for the next five years can easily be predicted and as such determine the state of the economic well – being of the citizenry up to 2010.

From the table 2, the GDP of the nation is expected to rise from N7, 752.80 in 2005 to N20, 480.64 in 2010 given that the economy achieved an annual growth of 2.9%.

CONCLUSION

The economic welfare which was proxied by the GDP was found to have been influenced at various degrees by agricultural output, inflation, subsidy, exchange rate, food import and export. Within the period being assessed, the economy grew at the rate of 2.9% per annum. On the basis of the findings, the study suggested that government should provide credit and incentives to farmers to bring about reduction in production cost and thus encourage increased output. Appropriate monetary policies should be adopted to engender stability in the markets (input, output, foreign exchange and money)

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Table 1: Ordinary Least Square Estimates of the Economic Factors

Variable	Linear	Exponential	Semi-log	Double-log
Constant	273883.09 (1.050)	12.556 (19.549)*	-4461144 (-3.233)*	1.686 (0.544)
Output	0.194 (0.017)	-2.62E-007 (-0.009)	250860.46 (-2.433)**	0.542 (2.340)**
Inflation rate	-1376.990 (-1.731)	-0.003 (-1.722)	-18194.43 (-0.774)	-0.120 (-2.491)**
Interest rate	2190.632 (0.785)	0.006 (0.891)	-23753.91 (-0.454)	-0.024 (-0.203)
Subsidy	28.569 (2.103)**	6.07E-005 (1.814)	54573.014 (1.518)	0.211 (2.626)*
Exchange rate	-1278.527 (-0.987)	-0.002 (-0.747)	-216487.0 (-1.846)	-0.685 (-2.327)**
Food Import	0.981 (1.313)	2.18E-006 (1.185)	156009.11 (2.302)**	0.373 (2.448)**
Food Export	2.264 (0.764)	5.06E-006 (0.695)	20423.491 (1.164)	0.408 (2.263)**
Real per capita Income	34.960 (0.167)	0.000 (0.222)	192212.54 (1.208)	0.468 (1.309)
R ²	0.920	0.910	0.951	0.955
F- Ratio	7.637	6.780	13.006	14.064
DW	2.774	2.772	2.797	2.320

Source: Computed from survey data, 2008

Values in parentheses are t – values

* and ** denote 1% and 5% significance respectively.

Table 2: The forecast of the GDP of Nigeria for the next five years.

Years	2006	2007	2008	2009	2010
Forecast	18,267.63	18,797.39	19,342.51	19,903.44	20,480.64
GDP(#,million)					
Average Growth Rate	===== 2.9%				

Source: Computed from Field Survey Data, 2008